CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

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EXPLOIT OF MALAYSIAN MANGO KERNEL EXTRACT AS ANTIBACTERIAL AGENT

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ABSTRACT

Mango (*Mangifera indica L.)* is a fruit belonging to the genus *Mangifera* and family *Anacardiaceae*, The significant increases of mango consumption in domestic activity lead to the accumulation of waste especially its kernel. This study attempts to screen three varieties of Mango kernels; waterlily, lemak and shakran extracted using four different extraction solvent; ethanol, methanol, acetone and distilled water to examine the potential of Mango kernel as natural antibacterial against four bacterial strains; *Staphylococcus aureus*, *Bacillus subtillis*, *Escherichia coli* and *Pseudomonas aeruginosa*. Disc diffusion assay was employed to determine the antibacterial activity. Later, the optimization of process conditions for extraction of antibacterial activity was conducted using the experimental design suggested by Central Composite Design (CCD) under Response Surface Methodology (RSM) from Design Expert v.6.0.8 by manipulating reaction temperature (°C), reaction time (hour) and agitation speed (rpm). It was found out that waterlily has the best antibacterial activity utilizing ethanol as the extraction solvent. Optimization was run and the maximum antibacterial activity (16.80 mm) was reached at 37°C, 24 hours and 200 rpm. Identification of the active compound using GC-MS recognized phenol, 2, 4-bis (1, 1-dimethylethyl) as the possible compound accountable for antibacterial activity. This finding would probably become an alternative source of natural antibacterial agents.

Keyword: Antibacterial activity, disc diffusion assay, *Mangifera indica* L., optimization.

INTRODUCTION

Mango, *Mangifera indica* L., tree is commonly cultivated in many tropical and subtropical regions, and its fruit is distributed essentially world-wide. There are over 500 classified of mango varieties. The genus of *Mangifera* consists of 69 species and mostly restricted to tropical Asia (Gulcin, *et al.*, 2004). Malaysia lies wholly within the tropics, which encompasses heavy precipitation, high temperatures and high humidity, which are the favoring